meteorological observations and the keeping of meteorological registers form a part of the common education of the people.''

W. M. D.

NOTES AND NEWS.

AT the Franklin Institute, Philadelphia, Monday evening, Feb. 17, Mr. George F. Kunz of New York lectured on precious stones, showing lantern illustrations of the Paris Exposition.

— The next meeting of the American Branch of the Society for Psychical Research will be held at the rooms of the Boston Society of Natural History, corner of Berkeley and Boylston Streets on Tuesday, March 4, at 8 P.M. Professor William James will preside. An abridgment of papers by Mr. Frank Podmore and Mr. F. W. H. Myers, on ''Phantasms of the Dead,'' will be read by the secretary. No admittance except by ticket.

— The New York Mineralogical Club made an excursion on Feb. 22 to Philadelphia, to visit one of the principal mineral localities and some important collections. Leaving by the 8 A.M. express, they reached Broad Street Station at 10.10. Here the party was met by representatives of the Mineralogical Section of the Philadelphia Academy. Thence, under the guidance of Mr. Theodore D. Rand, they went by rail to the Soapstone Quarry, on the Schuylkill, crossing exposures in the vicinity of the quarry, of most of the rocks of Philadelphia. Returning to Broad Street between 1 and 2 P.M., they visited the Academy of Natural Sciences during the afternoon, and the celebrated cabinet of Mr. Clarence S. Bement. The return to New York was by the train leaving Broad Street at 8.30 P.M.

— In the ''Third Annual Report of the Henry Draper Memorial,'' attention is called to the fact that the K line in the spectrum of ζ Ursæ Majoris occasionally appears double. The spectrum of this star has been photographed at the Harvard College Observatory on seventy nights, and a careful study of the results has been made by Miss A. C. Maury, a niece of Dr. Draper. The K line is clearly seen to be double in the photographs taken on March 29, 1887, on May 17, 1889, and on Aug. 27 and 28, 1889. An examination of all the plates leads to the belief that the line is double at intervals of fifty-two days, beginning March 27, 1887, and that for several days before and after these dates it presents a hazy appearance. The doubling of the line was predicted for Oct. 18, 1889, but only partially verified. The star was, however, low, and only three prisms could be used, while the usual number was four. The only satisfactory explanation of this phenomenon as yet proposed is that the brighter component of this star is itself a double star, having components nearly equal in brightness, and too close to have been separated as yet visually; also that the time of revolution of the system is one hundred and four days. When one component is approaching the earth, all the lines in its spectrum will be moved toward the blue end, while all the lines in the spectrum of the other component will be moved by an equal amount in the opposite direction if their masses are equal. Each line will thus be separated into two. The predicted doubling of the lines of ζ Ursæ Majoris on Dec. 8 was confirmed on that day by each of three photographs. Two more stars have been found showing a similar periodicity.

— The *Engineer* of Jan. 31 contains a leading article on color-blind engine-drivers, and it is interesting to note what the leading technical journal has to say on the subject: ''We do not say that no accident was ever brought about by the inability of a driver to distinguish between a green light and a red one, but we can say that nothing of such an accident is to be met with in the Board of Trade Reports.'' Our contemporary is of opinion that the testing of the sight of locomotive men should be made under working conditions, i.e., with actual signal lights.

— We learn from *Nature* of Feb. 6 that a paper on mortality from snake-bite in the district of Ratnagherry was read before the Bombay Natural History Society by Mr. Vidal, of the Bombay Civil Service. Many of the deaths in that district are, he says, due to a small and insignificant-looking snake, called ''foorsa'' by the natives. It is a viper rarely more than a foot long, and is so sluggish that it does not move out of the way till trodden on. Thus it is much more dangerous than the stronger and fiercer cobra.

— A new and very simple method of synthesizing indigo has been discovered by Dr. Flimm of Darmstadt (*Ber. deut. chem. Ges.*, No. 1, 1890, p. 57). In studying the action of caustic alkalies upon the monobromine derivative of acetanilide, $C_6H_5.NH.CO.CH_2Br$, a solid melting at 131.5°, it was found, that, when this substance was fused with caustic potash, a product was obtained which at once gave an indigo-blue color on the addition of water, and quite a considerable quantity of a blue solid resembling indigo separated out. The best mode of carrying out the operation, according to *Nature*, is described by Dr. Flimm as follows: ''The monobromacetanilide is carefully mixed with dry caustic potash in a mortar, and the mixture introduced into a retort and heated rapidly until a homogeneous reddish-brown melt is obtained. This is subsequently dissolved in water, and a little ammonia or ammonium-chloride solution added, when the liquid immediately becomes colored green, which color rapidly changes into a dark blue; and in a short time the blue coloring-matter is for the most part deposited upon the bottom of the vessel in which the operation is performed. The fused mass may also conveniently be dissolved in dilute hydrochloric acid, and a little ferric chloride added, when the formation of indigo takes place immediately. The collected blue coloring-matter may be readily obtained pure by washing first with dilute hydrochloric acid, and afterwards with alcohol.'' That this blue substance was really common indigo was proved by the fact that it yielded several of the most characteristic reactions of indigotin, such as solubility in aniline, paraffine, and chloroform; its sublimation; and the formation of sulphonic acids, which gave similar changes of color with nitric acid to those of indigotin. The final proof was afforded by its reduction to indigo white, and re-oxidation to indigo blue by exposure to air. Moreover, the absorption spectrum of the coloring-matter was found to be identical with the well-known absorption spectrum of indigo: hence there can be no doubt that indigo is really formed by this very simple process.

—A recent telegram from Tashkent, says *Nature*, announced that Col. Pevtsoff and M. Roborovsky had discovered a convenient pass to the north-western part of Thibet, from Nia, and had amounted to the great tableland. The plateau has there an altitude of 12,000 feet above the sea, and the country round is desolate and uninhabited, while towards the south the plateau is well watered and wooded. The Tashkent telegram is so expressed that it might be supposed to mean that two separate passes had been discoverd by the two explorers. But the news received from the expedition at St. Petersburg on Dec. 26, and dated Oct. 27, shows that both explorers proposed to leave the oasis of Keria (100 miles to the east of Khotan) on the next day, for Nia (65 miles farther east), and there to search for a passage across the border-ridge which received from Prjevalsky the name of the ''Russian Ridge.'' This immense snow-clad chain separates the deserts of eastern Turkestan from the trapezoidal space, the interior of which is quite unknown yet, and which is bordered by the ''Russian Ridge'' and the Altyn-tagh, in the north-west; the ridges of Tsaidam and those named by Prjevalsky ''Columbus'' and ''Marco-Polo,'' in the north-east; the highlands (explored by Prjevalsky in 1879–80) at the sources of the Blue River, in the south-east; and a long, yet unnamed ridge, which seems to be a prolongation of the Tan-la, in the south-west. The pass leading to that plateau from Nia, and now discovered by the Russian expedition, is situated some 80 miles to the east of the well-known pass across the Kuen-lun Mountains, which leads from southern Khotan to Lake Yashi-kul. M. Roborovsky's intention is evidently next to move up the Tchertchen River, and to endeavor to reach the ridges ''Moscow'' and ''Lake Unfreezing'' (11,700 feet high), which were visited by Prjevalsky from the east during his last journey. Having succeeded in finding a pass to Thibet in the south of Nia, Col. Pevtsoff proposes, as soon as the spring comes, to proceed himself by this pass to the tableland, while M. Roborovsky probably will be despatched

to explore the same border-ridge farther east, in the south of Tchertchen.

—The Western Union Telegraph Company has lately put in operation in Chicago a new plant of dynamo-machines to take the place of the gravity-batteries which have been used in the business of the company. The plant consists of eighteen dynamos of the Edison pattern, arranged in three gangs of six each. Two gangs are in constant use, the third held as reserve. Each gang is driven, independently, by a Sprague motor, power being furnished from the central station of the Edison Light and Power Company. The current for the Western Union lines radiating from Chicago has been furnished heretofore by gravity-batteries, aggregating something over thirty thousand cells, at a cost of about one dollar and twenty-five cents per annum for each cell. The reduction in cost of maintenance of storage space, and the improvement in efficiency, are very great. The Chicago office is the only telegraph station in this country where the gravity-battery has been entirely superseded by dynamo-machines, and marks a new departure in telegraphy. The plant and its connnections embrace many features and applications novel and interesting. The plans, designs, and calculations were worked out by Mr. L. L. Summers, one of the electricians of the Western Union Company, and under whose direct supervision the changes have been made, and whose success establishes his reputation as a competent scientific electrician.

—The first shipment of Java cinchona-bark in commercial quantities was made on Sept. 28, 1869, when fourteen packages, weighing altogether nine hundred pounds, left the island for Holland. The consignment was in the hands of the Netherlands Trading Company, and that organization called in two professors to give an opinion on the trial shipment. Their report was very favorable, says *Indische Merkur*, and the bulk of the shipment was sold privately to manufacturers and dealers. Five of the purchasers afterwards also gave their opinions of the bark; but all agree, that, owing to its immaturity and insufficient alkaloid contents, the cinchona was unfit for manufacturing purposes, although it would answer admirably for druggists' use. In 1870 the Java exports amounted to 41 bales and 28 cases, and on Oct. 20 of that year the first public auction of 876 kilos took place in Amsterdam. Up to 1883, one or two public sales were held every year. Last year there were ten, and for 1890 the same number is announced again. The first private planter to commence cinchona-growing in Java was Mr. K. F. Holle, in 1866; but not until about eight years later, when the first consignments of the rich Ledger barks had been shipped to Europe and realized enormously high prices, did private planters commence to pay special attention to the article. At first the intention of the shippers appears to have been to send all the Java bark for sale to London, where a market already existed for the article; but the Netherlands Trading Company determined to create a centre in Amsterdam, and the importance which that market has now acquired demonstrates the wisdom of their decision. In 1878, when it had been shown beyond doubt that the most valuable cinchona alkaloids were found principally in the outer bark layers, the then director of the Java Government plantations, Mr. Moens, decided to adopt the system of scraping the older Ledger trees; but after some seasons the scraping was found to be injurious to the trees, and since 1886 this method of harvesting has been abandoned in the government plantations, although it is still followed by a few private planters. At first all barks were cut to the uniform size of twenty centimetres (about eight inches), and brought to market in quills, all bark which could not be harvested in this manner being crushed to a coarse powder. The trade in the beginning offered considerable opposition to the sale of this powdered bark, as it was believed to facilitate sophistication, and also on the alleged ground that the powdered bark lost some of its alkaloidal richness by keeping. At present, however, the system of crushing bark has become universal in Java, and at the Amsterdam auctions nearly all the manufacturing barks are now offered in that condition, and the pharmaceutical barks in quills. Since 1874 it has been customary, according to the *Oil, Paint, and Drug Reporter*, to sort the Java quill bark into two classes, according to length.

—Possibly no food-product was more extensively shown at the Paris Exhibition than olives and olive-oil. In the French official catalogue 606 exhibiters of olive-oil are specially named, besides numerous collective exhibits, and many others which are included under the general term "comestible" or edible oils: 448 of these exhibiters are from Portugal, 128 from California, and only 12 from France. One French exhibit, however, is made by 67 associated producers. The Mediterranean has from time immemorial been the seat of the olive-culture, and, according to the *Journal of the Society of Arts*, Spain has about 3,000,000 acres under olives; Italy, 2,250,000; and France, about 330,000. Tunis has over 4,000,000 trees, Algeria 3,000,000, Nice 1,000,000, where olive-oil forms four-fifths of the agricultural produce, and Syria several million. The number of trees in other countries is unknown. Tuscany first exported olive-oil: hence its old name, "Florence oil." Forty-five distinct species of the olive-tree have been described, and in countries where it is indigenous the tree sometimes reaches a height of sixty feet, with a trunk circumference of twelve feet. Besides the difference in the nature of the wood, foliage, and habit of growth, there are large olives and small olives, pointed, oval, round, and curved fruit, and of all colors, ranging from white to black and from green to red. The flavor of the fruit is mild, sharp, or bitter, and according to the variety there is obtained sweet-oil, light-colored and of exquisite flavor, up to dark green, thick, and of a bitter taste, strong and very unpleasant to the taste.

—For the last forty years attention has been paid to the production of smokeless explosives, and in no country with more marked success than in England; and this is due mainly to the initiative and energy of Sir Frederic Abel. He is to-day looked up to, says *Engineering*, as a great authority on the subject of explosives; and it is not surprising, then, to find that the mere announcement that he was to give a "Friday evening" discourse brought to the theatre of the Royal Institution, London, not only a large number of those who have its *entrée*, but also knots of gentlemen from abroad who were eager to hear the very latest about smokeless explosives, and the probable effect of their introduction into naval and military warfare. Sir Fredric Abel spoke of the early efforts made in Germany in France to produce smokeless explosives, and dwelt with emphasis upon the superior intrinsic qualities of gun-cotton, pointing out at the same time that its application as a safe and reliable propulsive agent for military and naval use is still attended by many serious difficulties, — difficulties which will be ultimately overcome, and probably in the immediate future. Reference was made to melinite and other French explosives. Despite the secrecy with which their composition is kept, it is pretty certain that the chief element is picric acid; and, as this body is exceedingly unstable, it is probable that but little more will be heard about these much-vaunted destructive explosives. The most successful of contemporary experimenters with high explosives is Mr. Nobel, the inventor of dynamite and other efficient blasting-agents. He appears to have derived from nitro-glycerine and nitro-cotton a material which, when treated with camphor, compares very favorably with gun-cotton as to its ballistic properties, its stability, and uniformity, besides being almost absolutely smokeless. This powder has been tried in small arms in Italy, and reports are current that Mr. Krupp is carrying on experiments with it in guns of various caliber. Sir Frederic Abel corrected an impression that seemed to be spreading; viz., that the new powder would be not only smokeless, but also noiseless. It was shown that there is hardly any noticeable difference between the explosive violence of the new and the black powder. If any thing, the report of the former is sharper and more ringing, as well as of shorter duration. The absence of smoke in the battles of the future will call into requisition military qualities that up to the present have lain dormant.